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10/757,463	01/15/2004	Wei-Hong Wang	2019-0237P	5053
2292	7590	10/30/2007		
BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747				
			EXAMINER	
			MAYES, MELVIN C	
			ART UNIT	PAPER NUMBER
			1791	
			NOTIFICATION DATE	DELIVERY MODE
			10/30/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary

Application No.

10/757,463

Applicant(s)

WANG, WEI-HONG

Examiner

Melvin Curtis Mayes

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 8/15/07.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) 13-16 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>1/15/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

(1)

Applicant's election with traverse of Claims 1-12 in the reply filed on August 15, 2007 is acknowledged. The traversal is on the ground(s) that it should be no undue burden on the Examiner to consider all claims in a single application. This is not found persuasive because the method of fabricating the lamp device does not require that the device be used to treat waste gas in the manner as claimed in Claims 13-16.

The requirement is still deemed proper and is therefore made FINAL.

Claim Objections

(2)

Claims 8 and 9 are objected to because of the following informalities: "comprises" should read "comprising." Appropriate correction is required.

Claim Rejections - 35 USC § 112

(3)

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

(4)

Claims 3-5, 7 and 12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 3 claims adding H_4TiO_4 sol to form ratio of "about 0-10 wt%." As claimed "about 0-10 wt%" includes 0 wt%, i.e. not adding any H_4TiO_4 sol. If H_4TiO_4 is positively added, then the range should be greater than 0wt% up to 10wt%.

Claim 4 claims adding H_4TiO_4 sol to form ratio of "about 0-10 wt%." As claimed "about 0-10 wt%" includes 0 wt% and thus encompasses not adding any H_4TiO_4 sol. If H_4TiO_4 sol is positively added, then the claimed range should be greater than 0wt% up to 10wt%.

Claim 5 claims "melted into porous, transparent, and in roll form." This is not clear.

Claim 7 claims adding said oxidation catalyst when preparing the sol mixture, however depends from Claim 1 which claims impregnating the photocatalyst-coated cloth with the oxidation catalyst, thus impregnating after coating with the sol mixture, not with the sol mixture. Adding the oxidation catalyst in the sol mixture as claimed in Claim 7 does not further limit the method of Claim 1 and cannot depend from Claim 1.

Claim 7 claims "dipping in solution." This is not clear.

Claim 7 claims that step (4) comprises carrying out a baking process. Is this baking process thus carried out after impregnating and drying an oxidation catalyst or does this baking process refer to the baking of the sol mixture. In the specification, the only baking process described is that of the dried sol mixture on the cloth before impregnating with oxidation catalyst. The claim is interpreted as referring to this baking process of the sol mixture until

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Applicant can show where there is support in the specification for baking dried oxidation catalyst impregnated in an already photocatalyst-coated cloth or sleeve.

Claim 12 claims "it mixture sol coated..." which is unclear.

Claim Rejections - 35 USC § 103

(5)

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

(6)

Claims 1-3 and 5-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang 6,135,838 in view of the "Titanium dioxide photocatalysis" and Taoda et al. 5,670,206.

Wang discloses a method of making a lamp for air cleaning comprising:

formulating a photocatalyst coating sol such as of anatase TiO₂ and dip coating a glass fiber cloth or sleeve with the sol;

drying the coated cloth or sleeve;

impregnating the cloth or sleeve with a solution of an oxidation catalyst comprising precious metals or transition metal oxides;

drying again;

wrapping the cloth around a lamp tube or slipping the sleeve on a lamp tube; and

fixing the cloth or sleeve to the lamp by UV resistant glue or laser sintering (col. 3-9).

Wang discloses that providing the sol on a glass fiber cloth or sleeve provides an increased surface area of photocatalysts and can allow waste gases in the air to diffuse readily in the photocatalytic active sites. Wang discloses providing the glass fiber cloth or sleeve on a UV lamp tube but does not disclose providing the cloth or sleeve on a fluorescent lamp tube.

“Titanium dioxide photocatalysis” article teaches that odors objectionable to humans are due to compounds present only on the order of 10 parts per million by volume and at these concentrations, the UV light available from ordinary fluorescent lighting should be sufficient to decompose such compounds when TiO_2 photocatalysts are present (pg. 5).

Taoda et al. teach that a deodorizing lamp for decomposing malodorous substances can be made by providing TiO_2 , such as from a sol solution, on the surface of lamps including incandescent lamp, fluorescent lamp, black-light lamp, UV lamp, mercury-vapor lamp, xenon flash lamp, halogen lamp and metal halide lamp, either of cylindrical, bulbous or some complicated shape. For enhancing the effectiveness of the deodorizing lamp, the lamp unit is desired to produce light with a large shortwave light component. The TiO_2 absorbs harmful UV light emitted from the light source and the light emitted from the lamp is easy on the eyes and

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safe for the human body and can therefore be used as a room lamp (col. 2, line 1-23, col. 4, lines 6-15).

It would have been obvious to one of ordinary skill in the art to have modified the method of Wang by using the process to form photocatalyst on a fluorescent lamp tube instead of a UV lamp tube in order to provide a lamp which can be used as a deodorizing lamp for decomposing malodorous substances and also as a lamp that can be used as a room lamp, as taught by Taoda et al. Fixing the cloth or sleeve on a fluorescent lamp tube would have been obvious to one of ordinary skill in the art because the "Titanium dioxide photocatalysis" article teaches that even fluorescent lighting provides sufficient UV light to decompose odors and Taoda et al. teach that lamps for decomposing odors and which can be provided with TiO_2 from a sol solution include not only UV lamps but also incandescent lamps, fluorescent lamps, black-light lamps, mercury-vapor lamps, xenon flash lamps, halogen lamps and metal halide lamps. The use of the sol as coated on a glass fiber cloth instead of directly on the lamps such as a fluorescent lamp would have been obvious to one of ordinary skill in the art for the benefit of increased surface area of photocatalysts which allows gases in the air to diffuse readily in the photocatalytic active sites, as disclosed by Wang.

Regarding Claim 1, the use of a thermal plastic ring belt or sewing would have been obvious to one of ordinary skill in the art as alternatives to UV resistant glue or laser sintering for fixing the cloth or sleeve to the lamp.

Regarding Claim 2, Wang discloses that the sol can contain organic and/or inorganic salts of other metals such as W, Zn, Sn and Fe and the sol is made of Ti(OR)_4 with alcohol solvent and amount of water.

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Regarding Claim 3, Wang discloses that acids HCL and HNO₃ can be added to the TiO₂ sol to adjust the pH thereof to 1-3, thus using an acidic process to prepare the sol.

Regarding Claim 5, Wang discloses that the substrates such as glass fiber cloth is transparent.

Regarding Claim 6, Wang discloses that the sol coating on the cloth results in chemical bonding such that the coating does not peel easily from the cloth (col. 12, lines 42-47).

Regarding Claim 7, Wang discloses sintering (baking) the photocatalyst coating on the cloth or sleeve before impregnating with the oxidation catalyst and disclose impregnating with the oxidation catalyst coating by dipping.

Regarding Claim 8, Wang discloses that the oxidation catalyst can be Pd, Pt, Au or Ag precious metal salt solution such that the amount of oxidation catalyst in the photocatalyst is 0-10 wt%.

Regarding Claim 9, Wang discloses that the sol can contain organic and/or inorganic salts of other metals such as W, Zn, Sn and Fe in amount of 1-100% of the TiO₂ and the oxidation catalyst can be Mo, Nb, V, Ce or Cr transition metal salt solution such that the amount of oxidation catalyst in the photocatalyst is 0-10 wt%.

Regarding Claim 10, Wang discloses wrapping the cloth around a lamp tube or slipping the sleeve on a lamp tube.

Regarding Claims 11 and 12, it would have been obvious to one of ordinary skill in the art to have used a fluorescent lamp which emits visible light as well as a small amount of 365nm UV light and 405nm near UV light in order to provide UV light sufficient to decompose odors, as taught by the "Titanium dioxide photocatalysis" article and well as provide light that is easy

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on the eyes and safe for the human body and can therefore be used as a room lamp, as taught by Taoda et al.

(7)

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over the references as applied to claims 1 and 3, and further in view of Yamada et al. 5,897,958.

Yamada et al. teach that aqueous TiO_2 sol is stable only in pH range of not higher than 3 or not lower than 10 and teach using either acid or alkali to form the aqueous sol (col. 3, lines 8-12).

It would have been obvious to one of ordinary skill in the art to have modified the method of the references as combined by preparing the TiO_2 sol in an alkaline process using an alkali, as taught by Yamada et al., as an alternative to using an acid. Using either an acid in an acid process to adjust the sol to pH of 1-3 or using an alkali to adjust the pH of the sol to greater than 10 would have been obvious to one of ordinary skill in the art as alternatives, as Yamada et al. teach that the sol is stable only at either pH less than 3 or greater than 10 which can be done by using either an acid or alkali.

(8)

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over the references as applied to claim 1, and further in view of Ichikawa et al. 6,024,929.

Wang disclose including iron oxide photocatalyst with the TiO_2 photocatalyst.

Ichikawa et al. teach that fluorescent lamps emit light in the wavelength range of 290 nm - 750nm and for deodorizing, TiO_2 absorbs the UV light of wavelength 365 nm while iron oxide

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photocatalyst absorbs visible light of 405 nm and 436 nm wavelengths and is excited by the absorbed light (col. 7, lines 66-67, col. 8, lines 42-55, col. 11, lines 4-9).

By providing the photocatalyst-coated glass fiber cloth or sleeve on a fluorescent lamp, a lamp that emits visible light in the range of 420-700nm wavelength is obviously provided, as Ichikawa et al. teach that fluorescent lamps emit light in the wavelength range 290 nm - 750nm. Allowing the lamp to emit a small amount of light of wavelengths of 365 nm and 405 nm would have been obvious to one of ordinary skill in the art to provide UV light for absorption by the TiO₂ photocatalyst and light for absorption by the iron oxide photocatalyst for deodorizing, as taught by Ichikawa et al.

Conclusion

(9)

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

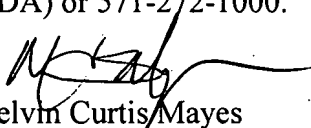
JP 11-290700 teaches covering a fluorescent lamp with a cloth coated with TiO₂.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melvin Curtis Mayes whose telephone number is 571-272-1234. The examiner can normally be reached on Mon-Fri 7:30 AM - 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Phillip C. Tucker can be reached on 571-272-1095. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Melvin Curtis Mayes
Primary Examiner
Art Unit 1791

MCM
October 25, 2007